

Session 7C: Marine Outfall Siting Study

Questions & Answers

Bruce Nairn

[Question not recorded.]

A: I use Payne Field, being the closest readily available wind source to the drogues at that time.

[Question not recorded.]

A: We did. I haven't tried to correct the drogue plots for wind, no, but there doesn't seem to be a correlation between the wind and trajectories although I'm sure there is a small fraction of drift due to the wind.

Kari Sauers

Q: Were there cards released during the drogue deployment where the drogues went up and down Possession?

A: No

Q: The graphic you showed with the cards collecting at Dungeness Spit, did you mean to indicate that the cards collected on the ocean side of the spit?

A: Yes, that was actually about 80 percent. There were a couple that were on the other side but they were generally on the tip, and there were a couple that were on that little strip but generally everything was actually toward the base and in the middle.

Kara Nakata

[Question not recorded.]

A: No our sampling dates, we just go out there basically a little bit more than once a month and so whether we happen to catch the specific events is kind of fortuitous, so we don't have continuous production data and so we don't have measurements of nutrients or chlorophyll at the time of the crash necessarily.

Dana Woodruff

Q: Why did you not sample near the ferries and underwater park?

A: That was really a decision that King County made and also for logistic reasons. We really didn't want to run over any divers in the underwater park or deal with the ferry terminal issues and the marina. It's hard to tow a side-scan unit through an underwater park or through the kelp bed north of it. And, also, south of there is a fully developed marina and we decided that we probably were not going to drive the outfall right through the Edmonds marina.

Q: The reason I ask is do you have any evidence that the ferries are disturbing things?

A: Not from this particular study we were not looking at that, no.

Q: We have done a lot of habitat mapping and things, and the habitat is the combination of the substrate and the biotic community on the substrate and we have a penchant for pulling that apart and putting it into bins of eelgrass and various other layers. And the first thing we do is separate all those things. In fact, that habitat is those combination of things. Did you look at how those combined into habitat units and then secondly, the critical thing for King County is how you translate that into habitat value, and because that is the management tool presumably that they are looking at?

A: We really went to that first step of developing the maps and at this point it was really a funding issue. We have not been able to take it to that next level, but I expect that King County will do so in the future. We would certainly encourage that. The data set is incredibly rich, and I understand what you are saying and I think that is a very worthwhile exercise.

[Question not recorded.]

A: We have not tried that, I think they would be somewhat effective. How effective would the techniques be in rocky reef habitats? I guess it depends on if they are really up against the shore and how steep it is and how comfortable you feel that the video camera can look at the additional resources there.

Q: I also listened to our keynote speaker yesterday during lunch. You have obviously have spent a lot of time and resources studying oceanic conditions in preparation for siting a new outfall. How much time have you spent in effort obtaining public input to attitudes and beliefs as you have in characterizing the receiving waters? I'd like to expand on that before you answer. I had the fortunate opportunity to live in Olympia in 1997-98 when LOTT was going through their public participation, public involvement public education process and in preparation of upsizing their outfall. Public attitude and belief played an important role in influencing future direction for LOTT.

A: Good question. We have had a series of public meetings already on this and a series of interviews with both the leaders and other groups in the area that will be ongoing. Obviously, I don't lead that part of it, but that's an important part of both scoping our studies and also that the actual siting and obviously, a major part of this is the siting of the treatment plant also. This is in some ways much more complicated than LOTT because we also have to site the plants, so you can imagine the public part of that. Scoping these studies, those interviews and meetings started probably two years ago and we do have publications on how that was done. The thing I should add that is relative to that, Dana's data set here is a beautiful one and we hope to have this up fairly soon on the web and so you can actually build coverages and look at this data online. We have it up and running on our internal system as a test, and I hope fairly soon everybody will be able to look at this. And we hope that this data set will obviously be of value for many other things, for shoreline planners in this area and other applications.

Q: The technique you used which combines side-scan sonar and underwater videography seems really neat because it gives you both wider spatial extent and also detail about the species through the underwater videography. In retrospect, what advice do you have about combining those two technologies together, would you do it exactly the same way you did?

A: No, actually I think we did learn quite a bit. We towed those systems separately, and we feel that we could combine those systems into one package which would cut our field time in half, and, depending on your interest in biological resources, if it's not as great I think, you could cut back on the underwater video in terms of ground truthing the side scan. But if you are real interested in invertebrates and fish then you would still need a lot of underwater video. So there are certainly some things that we would suggest in terms of refining the technique.

Q: I'm still confused about how many different vegetation types you can see with side-scan sonar? I've heard, yes, you can definitely see eelgrass. Can you see just the bladder kelps or can you see a wide range, what was your experience?

A: The kelp was a little bit problematic; we could see occasionally the stipes of the bull kelp. They look like just little light pencil marks, and you really had to know where to look, so this was also the reason we took additional visual information when we were towing as to where the kelp was and so we had a general idea and then we could go back to the side scan imagery, and say, oh yeah, it really is here and we might extend our area slightly. We would tow the camera through kelp unless it was a large bed and in that case, we really tried to avoid that, so it was a combination of techniques for kelp.

Q: This question goes a bit beyond the oceanographic research here, any impact from an outfall is going to be directly relatable to the degree of treatment for the planned outfall, what degree of treatment are you anticipating and how have your resources been parsed out as far as research into oceanography and research into possible alternatives to marine outfalls?

A: It's definitely true that the most important factor looking at the impact of an outfall is the level of treatment. But far and away, it's not where the outfall is or how the outfall is designed. Our assumption on this project is that it will be a secondary treated outfall as our other ones are. As we are looking at the size of the plant sites we are making sure that we have enough size there on land to provide for additional treatment in the future, if that's necessary. Another important part of this project is also water reuse. So in the siting of the plant and the conveyance system that reuse of water is a critical thing. We would rather not be putting this water into the Sound if there is [no] need for it. One problem is most of the need for the water from a system like this doesn't occur in the months that you have the highest flows. People want a lot of water July, August, September. The highest flows are November, December, January. But the water reuse will be an important part of this with the aim to make the outfall unneeded in the future, that would be a longtime goal, but the mix match of demand and supply is a problem, it's an important factor though.

[Question not recorded.]

A: We have also been taking transects all the way up into Possession Sound looking at the oxygen up there. It is a much more highly stratified system, it has large organic loads from the Snohomish River and Skagit River and it also tends to hold the low oxygen oceanic water every year.

Q: What other water measurements have you taken to look at the situation now?

A: Scott Mickelson has two posters downstairs from our staff. One is looking at conventional water properties in the Sound. There's been a large ongoing effort to look at the existing water quality. And also he has paper on trace metal concentrations in Puget Sound with the same goal, to look at what is the existing situation, do we also measure organics in the open water, which was quite a technical challenge, so I'd talk to him about that, but that is a good point. That is one of the things that we did not present here, we also did a lot of submarine geology that we did not present here because of time.

[Question not recorded.]

A: In terms of physical oceanography, the ADCPs are showing those flows down deep. Some of the drogues have been set as deep as 120 meters. We are taking CID cruises that go all the way to the bottom with transects across this whole area on a regular basis so we are measuring that.

[Question not recorded.]

A: Not when we did the side scan so much. We did a separate study doing both side scan and [another approach] that was done by Golder Associates, Dick Sylvester, and that basically covered this whole area but also went deeper, went out to the toe of the slope. So that is one of the other data sets that we did not have time to present here but that was a separate study, that went 10-meter sub-bottom. We have not done any actual soil borings or sediment measurements that you can appreciate from the size of the study area and how fine-scale those would need to be, but that is going to have to wait until we actually have an outfall location and it will be more efficient, but we will have that data.

[Question not recorded.]

A: That is being considered. We've done a literature review of the surface microlayer conditions up to date just to see what was out there. In all these studies, we always started with that, what is the existing data, what is the existing literature, so that would be the next step to look at. That is a technical challenge as you know but interesting to us.